BROADLEAF WEED CONTROL RESEARCH

Katie Hanson and B.E. Branham
Crop and Soil Sciences, M.S.U.

Broadleaf weed control studies were conducted in 1985 to compare the activities of several experimental or recently marketed herbicides to that of more commonly used compounds. Herbicides were tested on six common broadleaf turf weeds including Canada thistle, white clover, yellow woodsorrel, wild violet, and two species of speedwell. All of these weeds, with the exception of white clover, are considered "hard to control". Since white clover is usually controlled only by MCPP, it was included to test for sensitivity to any of the newer herbicides.

Herbicides evaluated included XRM 433, an experimental product from Dow Chemical. XRM 433, or fluoroxypyr, is currently available in Europe as Starane for broadleaf weed control in wheat. Super Trimec, a Gordon herbicide, is another treatment we evaluated which is a mixture of MCPP, dicamba, triclopyr, and 2,4-D. Garlon 4, Turflon D, and Turflon amine are three more Dow products tested. Garlon 4 contains triclopyr ester as the active ingredient and has previously been used for brush control. Turflon D and Turflon amine also contain triclopyr, but in combination with 2,4-D. Turflon D consists of triclopyr ester plus 2,4-D ester while Turflon amine is an experimental herbicide with amine formulations of both triclopyr and 2,4-D. The final two Dow products evaluated were Esteron (2,4-D ester) and Formula 40 (2,4-D amine).

Weedone DPC and Buctril were two Union Carbide herbicides included in these studies. The active ingredient in Weedone DPC is 2,4-DP while Buctril is a contact herbicide containing bromoxynil.

Finally, MCPP was included in view of its activity on white clover. Canada thistle was treated on two dates; 8/16 and 9/20 (Table 1). Thistle population was not noticeably reduced following the first application date, possibly in response to the concurrent dry weather conditions. However, Turflon D, Turflon amine, and several other herbicides showed good control four weeks after the second application date. The improved level of weed control observed after 9/20 may be a result of two contributing factors. First of all, plants may have been weakened by the earlier herbicide application and were thus more subject to injury. Secondly, mild weather conditions which supported vigorous weed growth may have increased herbicide uptake and translocation to all plant parts. These results demonstrate the importance of proper application timing for optimum weed control.

In trials dealing with white clover and yellow woodsorrel control, XRM 433 and Turflon D provided the best weed reduction (Tables 2 and 3). While LSD values are high in these data, herbicide % control rankings are similar to those in previous experiments.

None of the herbicides satisfactorily controlled wild violet (Table 4). Four weeks after treatment, both Garlon 4 and Buctril resulted in about 67% weed reduction. Poor herbicide response may be partly due to the low air temperature during application -- only 48°F. Further evaluations of this study will follow in the spring.

Control of two speedwell species involved what we identified as Veronica filiformis and Veronica serpyllifolia. However, plants were identified in the vegetative state, and since positive species separation requires the presence of flowers, we consider the above species designations to be preliminary. Several of the herbicides completely erradicated V. filiformis (Table 5). This weed typically grows in heavy shade and the associated turf is subject to a high degree of spray injury; a situation which occurred in this study. XRM 433 at 0.5 lbs. ai/A, Garlon 4, Turflon D, and Turflon amine all produced browning of grass blades. A thinner than normal leaf cuticle, commonly found in shaded grasses and broadleaves, may have contributed to the unusual sensitivity of both turf and weeds to numerous herbicides.

Veronica serpyllifolia appears more difficult to control than V. filiformis. In this case, Dacthal, a preemergence herbicide, resulted in the highest % control (Table 6), but only after three months had elapsed. Following application, grass and weeds in Dacthal-treated plots became dark green for several weeks before V. serpyllifolia died.

TABLE 1. Canada thistle control (Cirsium arvense L.)

Herbicide	rate (lbs ai/A)	% control
Turflon D	1.0 + 0.5	98.7
Super Trimec	0.75 + 0.75 + 0.18	97.0
Weedone DPC + Buctril	0.75 + 0.5	93.3
Turflon amine	0.5 + 1.3	92.7
Weedone MCPP	1.5	91.7
Formula 40	1.0	91.3
Esteron	1.0	88.0
Weedone DPC	0.92	85.7
Turflon amine	0.38 + 1.0	84.7
Garlon 4	0.5	84.0
Buctril	2.0	74.7
check	---	43.3
XRM 433	0.5	34.0
XRM 433	0.25	29.0

$LSD_{.05}$ = 16.1

treated 8-16-85; temperature: 65°F
9-20-85; temperature: 68°F
final rating 10-18-85

TABLE 2. White clover control (Trifolium repens L.)

Herbicide	rate (lbs ai/A)	% control
XRM 433	0.5	99.3
Super Trimec	0.75 + 0.75 + 0.18	99.0
Garlon 4	0.5	63.3
XRM 433	0.25	62.3
Turflon D	1.0 + 0.5	57.7
Weedone DPC	0.92	53.7
Weedone DPC + Buctril	0.75 + 0.5	50.0
Weedone MCPP	1.5	41.0
Turflon amine	0.38 + 1.0	40.3
Formula 40	1.0	20.7
check	---	20.0
Esteron	1.0	16.7
Turflon amine	0.5 + 1.3	13.3
Buctril	2.0	0.0

$LSD_{.05}$ = 60.8

treated 7-12-85; temperature: 72°F
final rating 9-5-85

TABLE 3. Yellow Woodsorrel control (Oxalis stricta L.)

Herbicide	rate (lbs ai/A)	% control
XRM 433	0.5	1.00
XRM 433	0.25	98.7
Super Trimec	0.75 + 0.75 + 0.18	97.3
Turflon D	1.0 + 0.5	96.0
Weedone DPC + Buctril	0.75 + 0.5	95.7
Garlon 4	0.5	90.3
Weedone DPC	0.95	69.7
Weedone MCPP	1.5	64.3
Buctril	2.0	49.0
Turflon amine	0.38 + 1.0	48.3
Esteron	1.0	33.3
Turflon amine	0.5 + 1.3	32.3
Formula 40	1.0	22.7
check	---	22.3

$LSD_{.05}$ = 51.3

treated 8-17-85; temperature: 65°F
final rating 9-19-85

TABLE 4. Wild violet control (Viola spp.)

Herbicide	rate (lbs ai/A)	% control
Garlon 4	0.5	67.3
Buctril	2.0	67.3
Turflon D	1.0 + 0.5	66.3
XRM 433	0.5	62.3
XRM 433	0.25	61.0
Weedone DPC + Buctril	0.75 + 0.5	60.3
Turflon amine	0.5 + 1.3	52.7
Super Trimec	0.75 + 0.75 + 0.18	48.0
Weedone DPC	0.92	47.7
Weedone MCPP	1.5	44.3
Esteron	1.0	39.3
Turflon amine	0.38 + 1.0	39.0
Formula 40	1.0	24.3
check	---	20.7

$LSD_{.05}$ = 20.4

treated 9-28-85; temperature: 48°F
final rating 10-23-85

TABLE 5. Speedwell species control:

Veronica filiformis

Herbicide	rate (lbs ai/A	% control
XRM 433	0.25	100.0
XRM 433	0.5	100.0*
Weedone DPC + Buctril	0.75 + 0.5	100.0
Weedone MCPP	1.5	100.0
Super Trimec	0.75 0.75 + 0.18	100.0
Turflon D	1.0 + 1.5	98.7*
Esteron	1.0	94.7
Weedone DPC	0.92	94.7
Dacthal	10.5	92.3
Formula 40	1.0	89.7
Buctril	2.0	83.7
Turflon amine	0.5 + 1.3	72.3*
Garlon 4	0.5	65.3*
check	---	0.0

$LSD_{.05}$ = 18.7

treated 8-20-85; temperature: 55°F
final rating 9-11-85
*spray injury on turf (burning)

TABLE 6. Speedwell species control:

Veronica serpyllifolia

Herbicide	rate (lbs ai/A)	% control
Dacthal	10.5	87.3
Turflon D	1.0 + 1.5	70.0
Garlon 4	0.5	60.3
Buctril	2.0	57.3
XRM 433	0.5	48.3
XRM 433	0.25	26.0
Weedone DPC + Buctril	0.75 + 0.5	20.0
Turflon amine	0.5 + 1.3	14.3
Esteron	1.0	12.0
Weedone DPC	0.92	9.0
Super Trimec	0.75 + 0.75 + 0.18	7.0
check	---	5.3
Weedone MCPP	1.5	5.3
Formula 40	1.0	0.0

$LSD_{.05}$ = 38.0

treated 7-19-85; temperature: 67°F
final rating 10-22-85